



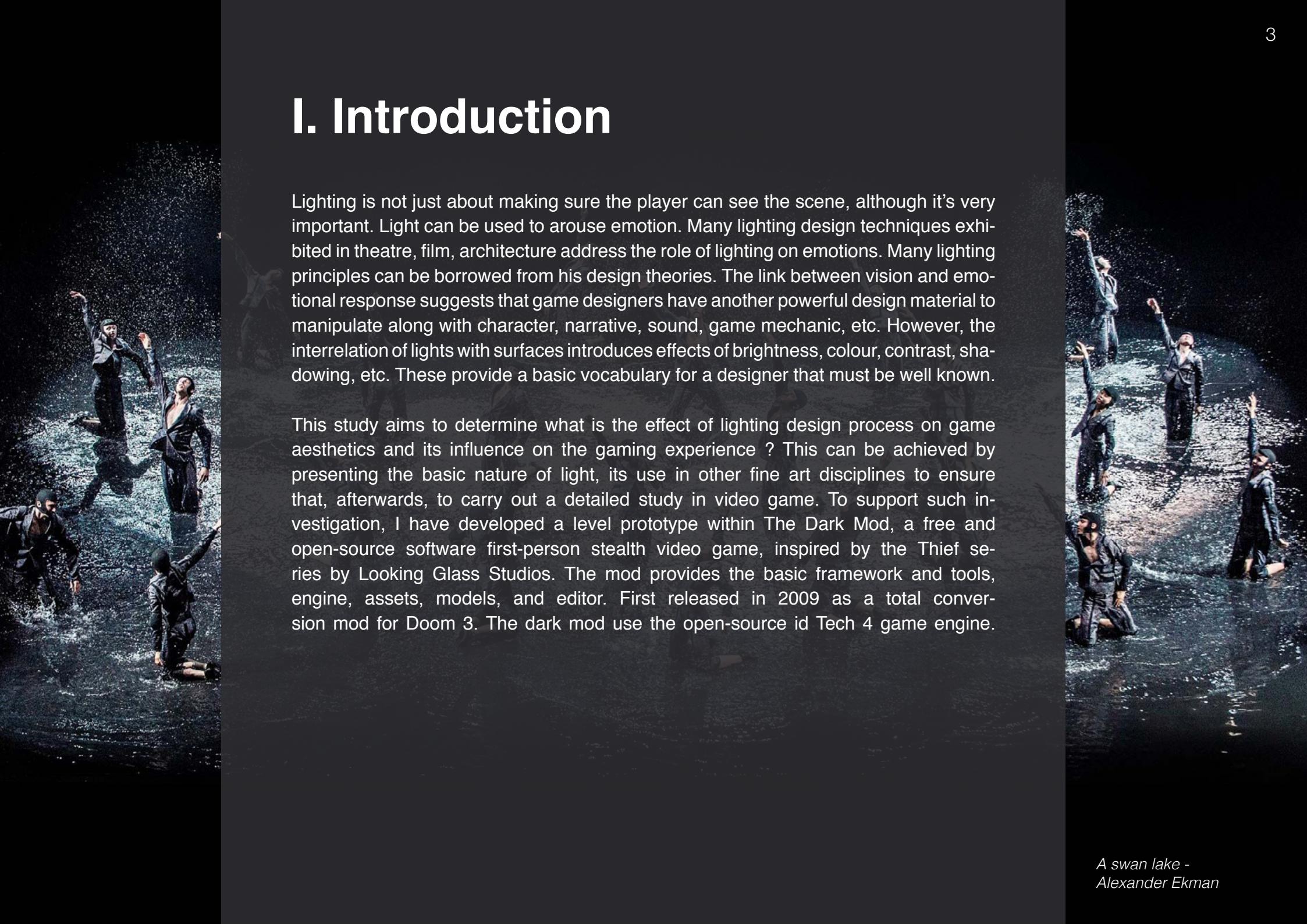
What is the effect of Lighting design process on game aesthetics and its influence on the ga- ming experience?

A master's thesis made by Ronan Houzé - August 2019

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I. Introduction

The background of the slide features a photograph from the ballet "A swan lake" by Alexander Ekman. It shows several performers in dark, expressive costumes on a stage with water splashing around them. One performer in the foreground is kneeling, while others are standing or moving gracefully. The lighting is dramatic, creating strong highlights and shadows on the performers and the water.

Lighting is not just about making sure the player can see the scene, although it's very important. Light can be used to arouse emotion. Many lighting design techniques exhibited in theatre, film, architecture address the role of lighting on emotions. Many lighting principles can be borrowed from his design theories. The link between vision and emotional response suggests that game designers have another powerful design material to manipulate along with character, narrative, sound, game mechanic, etc. However, the interrelation of lights with surfaces introduces effects of brightness, colour, contrast, shadowing, etc. These provide a basic vocabulary for a designer that must be well known.

This study aims to determine what is the effect of lighting design process on game aesthetics and its influence on the gaming experience ? This can be achieved by presenting the basic nature of light, its use in other fine art disciplines to ensure that, afterwards, to carry out a detailed study in video game. To support such investigation, I have developed a level prototype within The Dark Mod, a free and open-source software first-person stealth video game, inspired by the Thief series by Looking Glass Studios. The mod provides the basic framework and tools, engine, assets, models, and editor. First released in 2009 as a total conversion mod for Doom 3. The dark mod use the open-source id Tech 4 game engine.

A swan lake -
Alexander Ekman

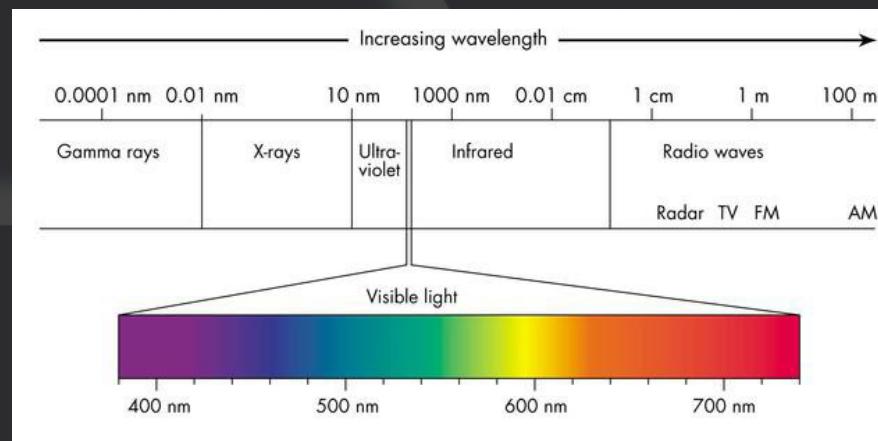
II. The basic nature of light

“Space and light and order. Those are the things that men need just as much as they need bread or a place to sleep.” – Le Corbusier

The instant we are born, natural light has guided and accompanied us. It is intuitive to our needs and caters to our natural rhythm. It controls human processes and influences our internal clock. Consequently, an exploration in light flow, intensity, colour and focus points are made to study what is light made of and how does it react ?

1. What does the human eye see ?

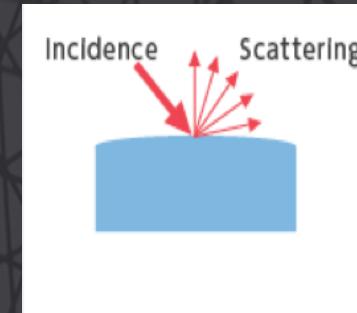
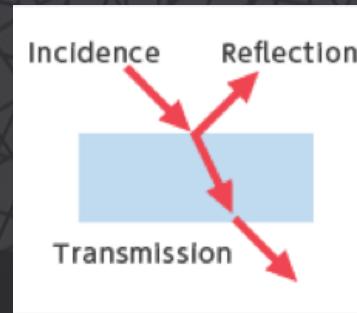
Light is that part of the electromagnetic spectrum that is perceived by our eyes. The wavelength range is between 380 and 780 nm. The cones come on during the day and we see colours, whereas at night the rods take over and we only see shades of grey. The primary properties of visible light are propagation direction, intensity, frequency and polarization. Its speed in a vacuum, 300.000.000 meters per second, is one of the fundamental constants of nature.



Pink Floyd -
The dark side of the moon

2. Propagation direction

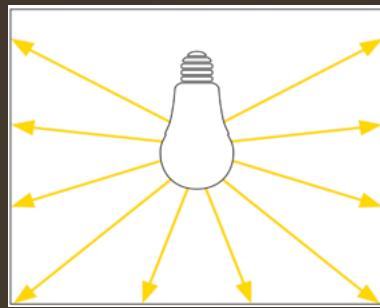
When in a vacuum, where no matter is present, light travels straightforward. However, light behaves in different ways when it comes in contact with water, air, and other matters. When light strikes matter, a part of that light is absorbed and is transformed into heat energy. If the matter that the light strikes is a transparent material, the light component that was not absorbed is transmitted through and exits to the outer side of the material. If the surface of the material is smooth, such as a mirror, it happens reflection, but if the surface is irregular, such as having pits, the light scatters.



3. Basic parameters

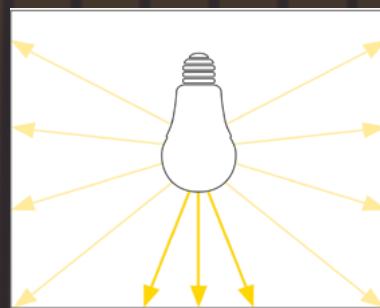
Luminous flux [unit: lumen (lm)]

The luminous flux describes the quantity of light emitted by a light source.



Luminous intensity [unit: candela (cd)]

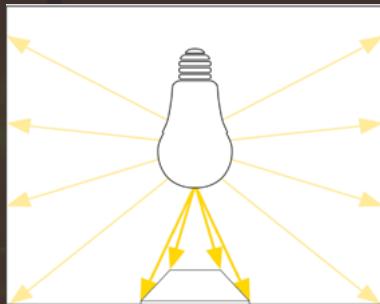
The luminous intensity describes the quantity of light that is radiated in a particular direction.



Illuminance [unit: lux (lx)]

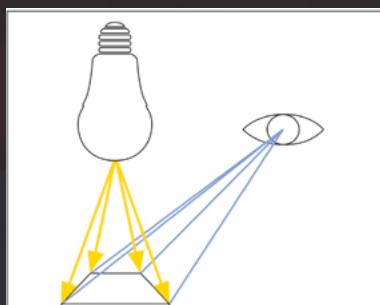
Illuminance describes the quantity of luminous flux falling on a surface

$$\text{Illuminance} = \text{luminous flux (lm)} / \text{area (m}^2\text{)}$$



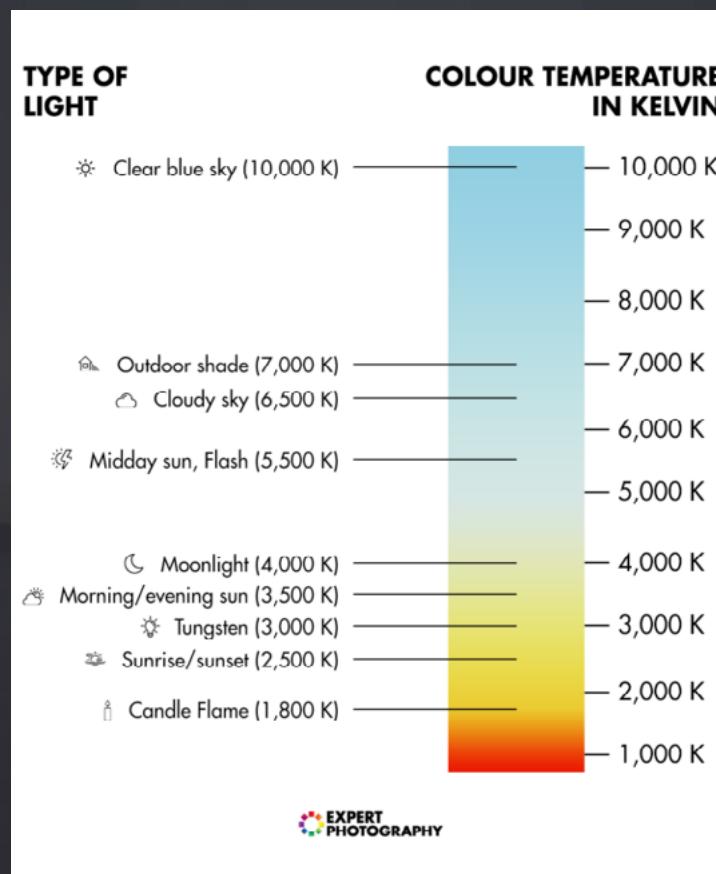
Luminance [unit: candela/m²]

Luminance is the only basic lighting parameter that is perceived by the eye. It describes on the one hand a light source's impression of brightness, and on the other, a surface and therefore depends to a large extent on the degree of reflection (colour and surface).



4. Colour temperature

Colour Temperature is a measurement in Degrees Kelvin that indicates the hue of a specific type of light source. The British physicist William Kelvin heated a block of carbon. It glowed, producing a range of different colours which correspond to different temperatures. The block of carbon first produced a dim red light, increasing to a brighter yellow as the temperature went up. At the highest temperatures it produced a bright blue-white glow.

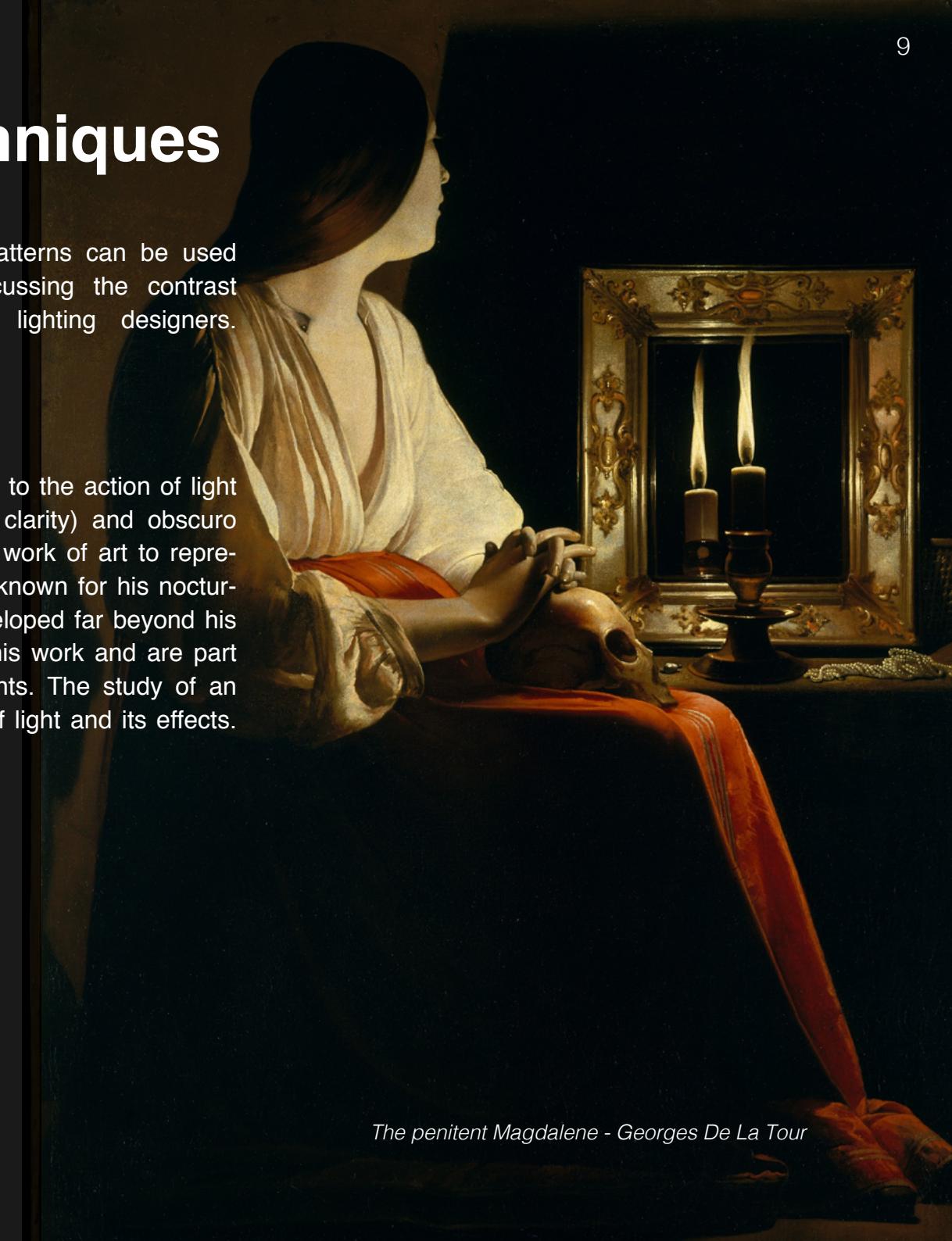


III. Lighting design techniques

In this section, we address the question of what lighting patterns can be used to manipulate dramatic content. We will do this by discussing the contrast and affinity lighting techniques used by painters and lighting designers.

1. Chiaroscuro and tenebrism theory

Chiaroscuro is one of the concepts of the theory of art related to the action of light and darkness. The word comes from Italian: chiaro (light - clarity) and oscuro (darkness - darkness). It refers to the progressive tones of a work of art to represent volume and stimulate mood. George De La Tour is best known for his nocturnal light effects and candle-lit chiaroscuro scenes that he developed far beyond his artistic predecessors. Light and darkness play a vital role in his work and are part of his composition in various and often alternate arrangements. The study of an image of De La Tour may help to better understand the use of light and its effects.



The penitent Magdalene - Georges De La Tour

1.1. High contrast

This painting uses light tone in particular on the face and clothing areas against the dark tone of the background. The result is a high contrast of tone and the viewer's attention will focus on this part. This contrast does not exist in reality. The distance between the face and candle is further than that of the candle and hands, but the tone and contrast on the hands is much lower as compared to that on the face. Georges de La Tour's using contrast with variety to attract the viewer's attention.



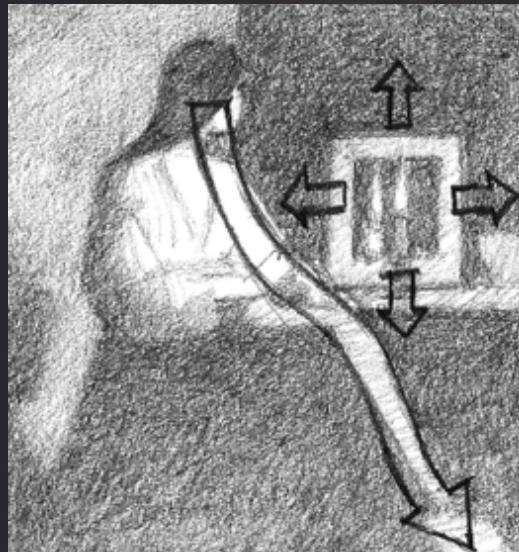
Yakup Mohd Rafee, deconstruction drawing of Georges de La Tour (2011)

Magdalene of night light, 1630-1635, charcoal on paper

*The penitent Magdalene -
Georges De La Tour*

1.2. Contours and rythm of light

Because of the high tonal difference in some areas, it forms contours especially on the edge of figure. Even in a darker area, the painter liked to use different tones to accentuate borders between the subject and the background. The light tone is not focused on only one area but slanting down from the face to the feet.



Yakup Mohd Rafee, deconstruction drawing of Georges de La Tour (2011)

Magdalene of night light, 1630-1635, charcoal on paper

*The penitent Magdalene -
Georges De La Tour*

1.3. Source of light

Most of the works of Georges de La Tour use lights candles or lamps as the light source. However, a candle here is a setup and we already know that light and dark in this work are not based on the light distributed by it. Georges de La Tour painted a dark background near a part of the face and a candle to create a contrast. To obtain a high contrast value, he associated a light tone with a dark tone to obtain an optimal effect.



Yakup Mohd Rafee, deconstruction drawing of Georges de La Tour (2011)

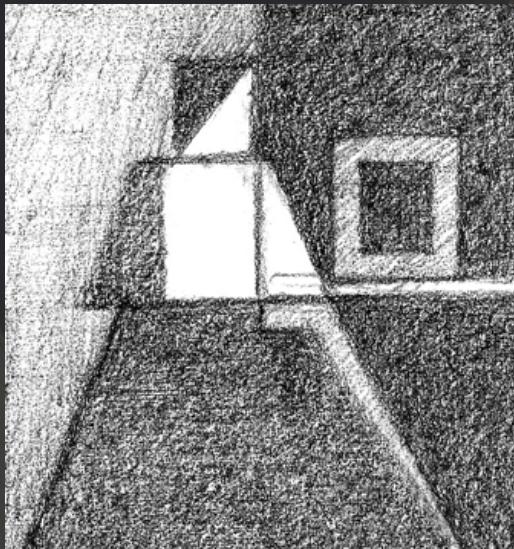
Magdalene of night light, 1630-1635, charcoal on paper



*The penitent Magdalene -
Georges De La Tour*

1.4. Light and dark as a geometrical composition

If we simplify the light and darkness in this work, we can see a basic geometric shape. The composition is simple with the union between light and dark tones. The layout of this work indirectly also gives an impression of space in which the position of the object and the figure shows the front and back of the work, creating more tension and energy.



Yakup Mohd Rafee, deconstruction drawing of Georges de La Tour (2011)

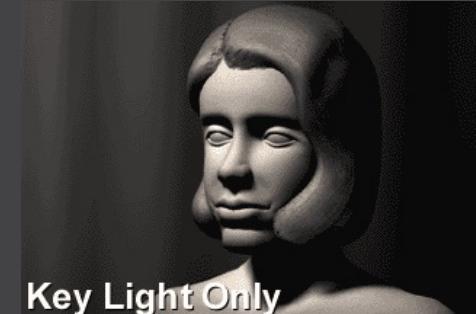
Magdalene of night light, 1630-1635, charcoal on paper

*The penitent Magdalene -
Georges De La Tour*

2. Basic cinematography lighting techniques

2.1 Three point lighting

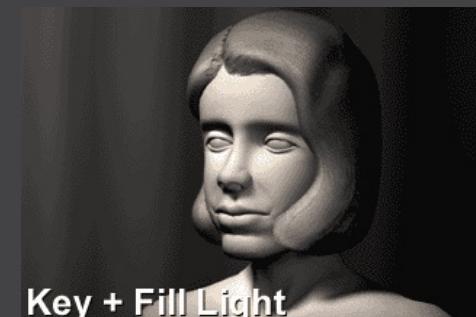
One of the most popular and attractive ways to illuminate any subject is with a classic Hollywood lighting schema called three-point lighting. Three-point lighting is a design technique to convey a subject its full three-dimensional form.



Key Light Only

Key Lighting (also referred to main source of illumination)

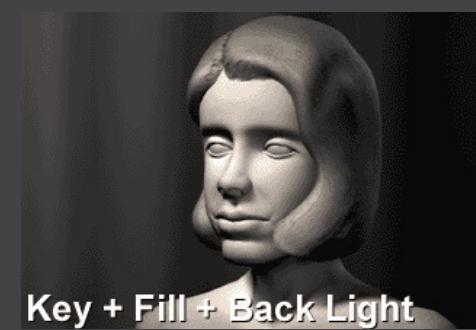
The key light is also known as the main light of a scene or subject. It's normally the strongest light in each scene. Key light can be placed anywhere, even from the side or behind a subject.



Key + Fill Light

Fill Lighting (also referred to contrast management)

As the name suggests, it is used to “fill in” and remove the dark, shadowy areas that the key light creates. It is noticeably less intense and placed in the opposite direction of the key light.



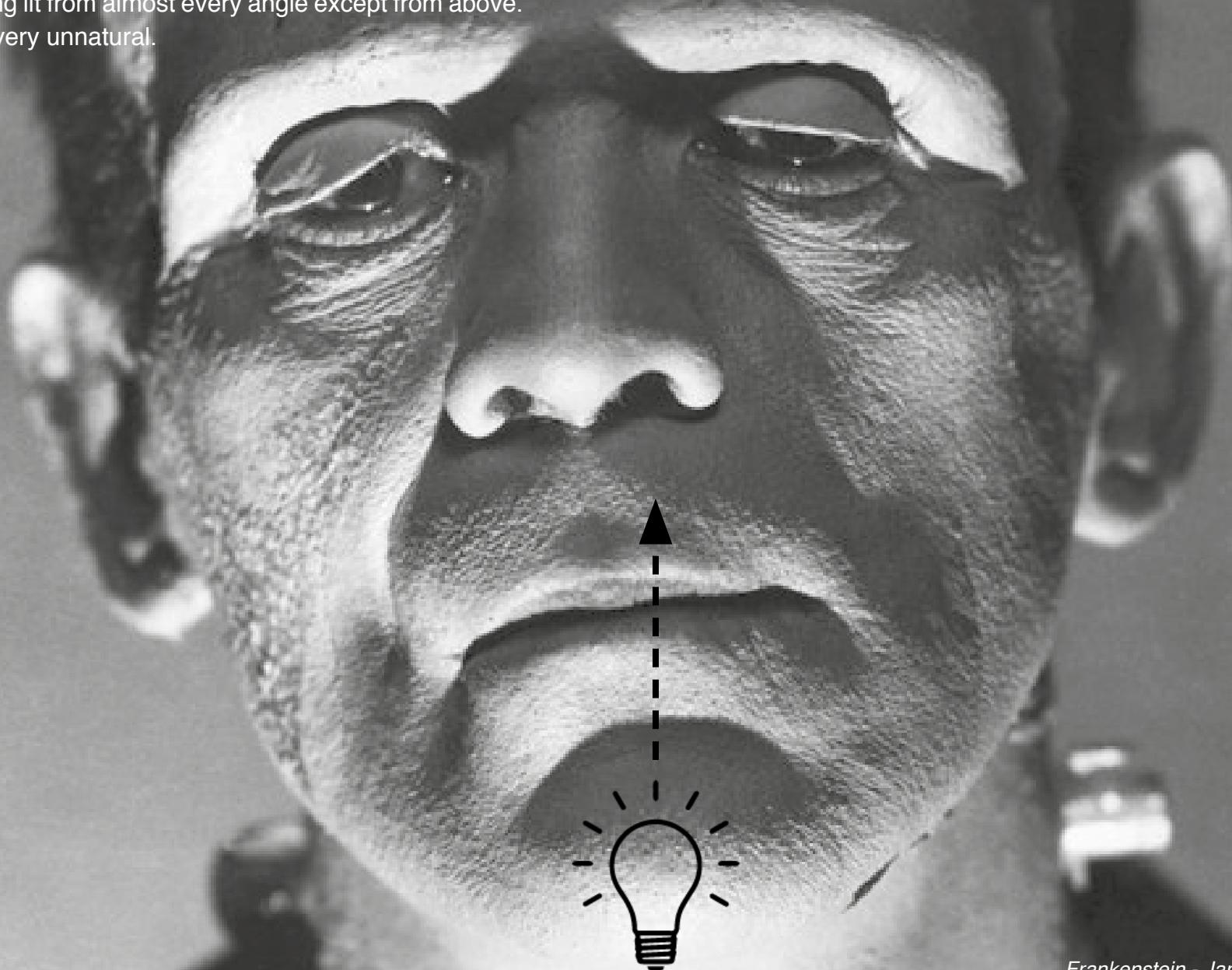
Key + Fill + Back Light

Backlighting (also referred to background separator)

Backlighting is used to create a three-dimensional scene. This has to separate the subject from the background. As with fill lighting, it must be less intense and covers a wider area of a subject.

2.2. From below

Because of the movement of the sun, we're used to seeing people being lit from almost every angle except from above. So it feels very unnatural.



Frankenstein - James Whale - 1931

2.3. Backlighting

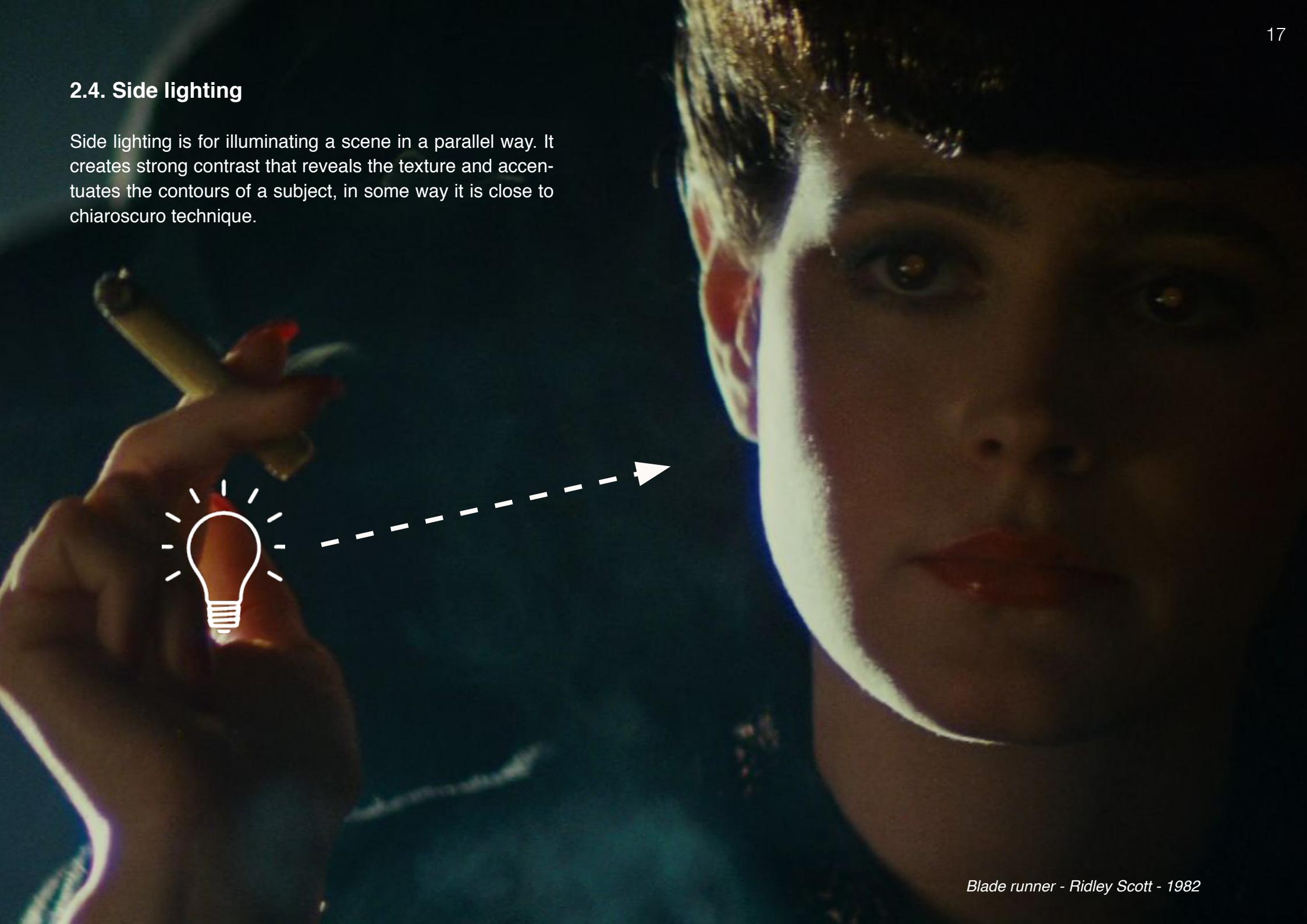
The lighting instrument and the viewer face each other, with the subject in between. This creates a glowing effect on the edges of the subject, while other areas are darker



E.T. The extra terrestrial - Steven Spielberg - 1982

2.4. Side lighting

Side lighting is for illuminating a scene in a parallel way. It creates strong contrast that reveals the texture and accentuates the contours of a subject, in some way it is close to chiaroscuro technique.



Blade runner - Ridley Scott - 1982

2.5. Practical lighting

The practical lighting consist in using regular and functional light sources such as lamps, candles, TV. Additional, hidden motivated light can be used to adjust the intensity of the light.



Barry Lyndon - Stanley Kubrick - 1975

2.6. Bounce lighting

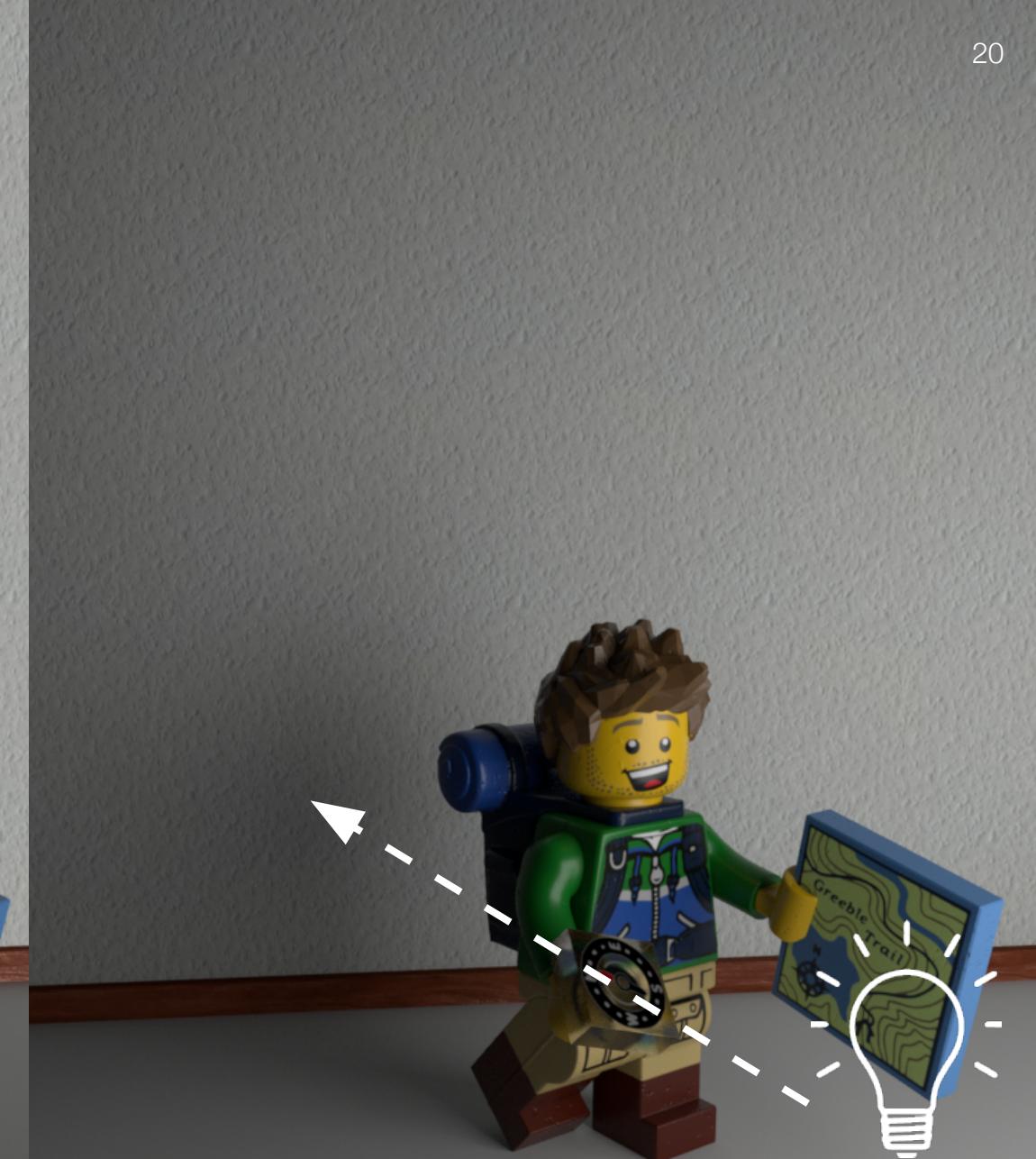
Bounce lighting is about scattering the light from a strong light source by using a reflector or any surface, such as walls and ceilings. Doing so creates a bigger area of light that is more evenly distributed.



Batman : the dark knight rises - Christopher Nolan- 2012

2.7. Hard and soft lighting

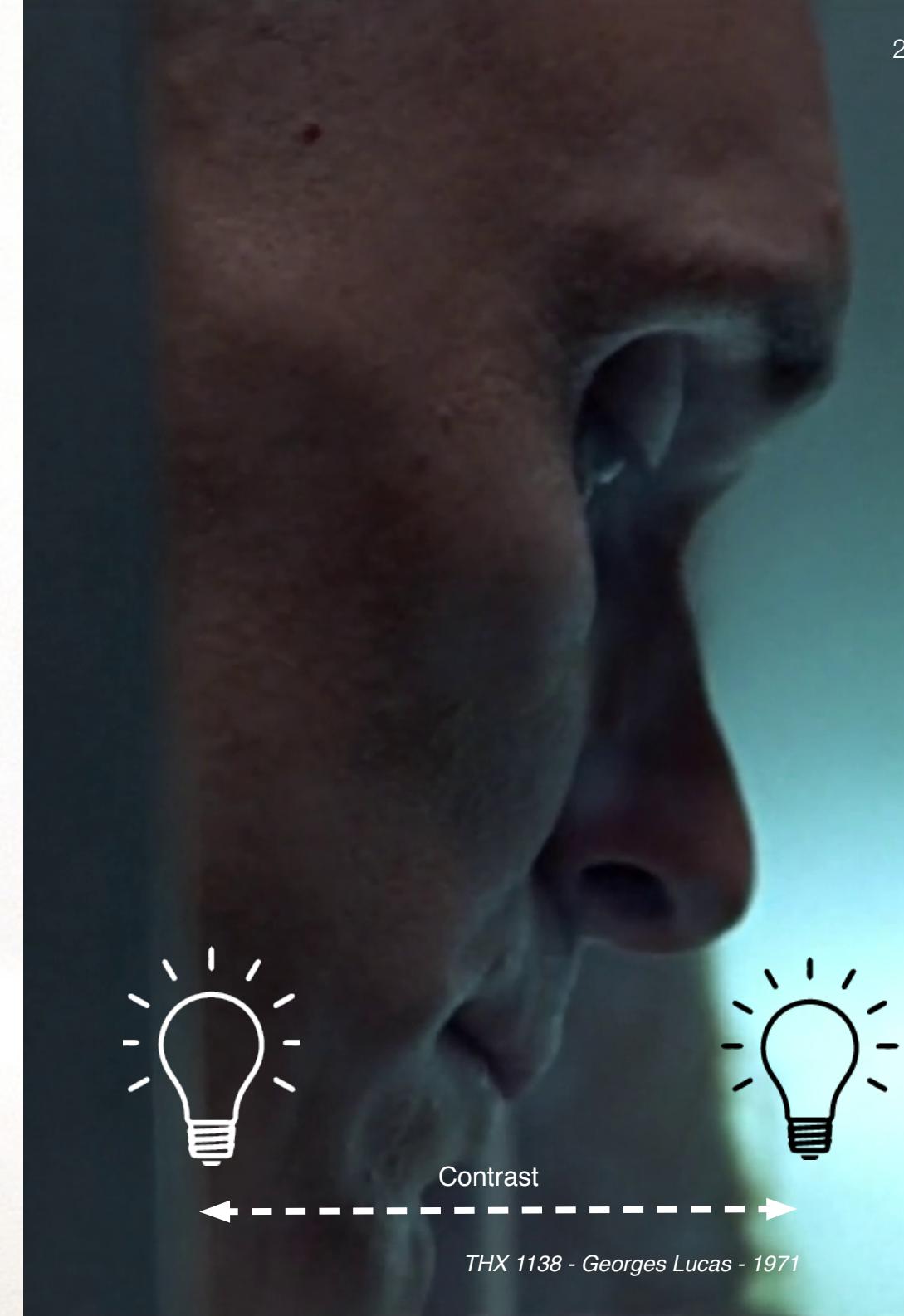
The main difference between hard and soft light is the size of the light source relative to the subject. The sun is the largest source of light in the solar system. But as it is more than 90 million kilometres, it is a small source of light. This is why it produces shadows hardness, therefore it is related to hard lighting. If there are clouds, the whole sky becomes a huge source of light and you can barely see shadows. Consequently it is a soft light.



2.8. High and low key

High key refers to a lighting style used to create a very bright scene. Often close to overexposure. All the light sources have approximately the same intensity.

Unlike high key lighting, the low key lighting of a scene would mean a lot of shadows and perhaps a powerful light source. The focus is on the use of shadows, rather than the use of lighting, in order to create suspense or drama to a subject.



THX 1138 - Georges Lucas - 1971

2.9. Motivated lighting

Motivated lighting is used to emulate a source of natural light, such as sunlight, moonlight and streetlights. It is also used to enhance practical lights. To make the motivated as natural lighting as could be expected, several methods are used, such as the use of filters (gobo) to create window shades, etc ...



2.10. Ambient lighting

Whether it's sunlight, moonlight, street lights that already exist on the set.

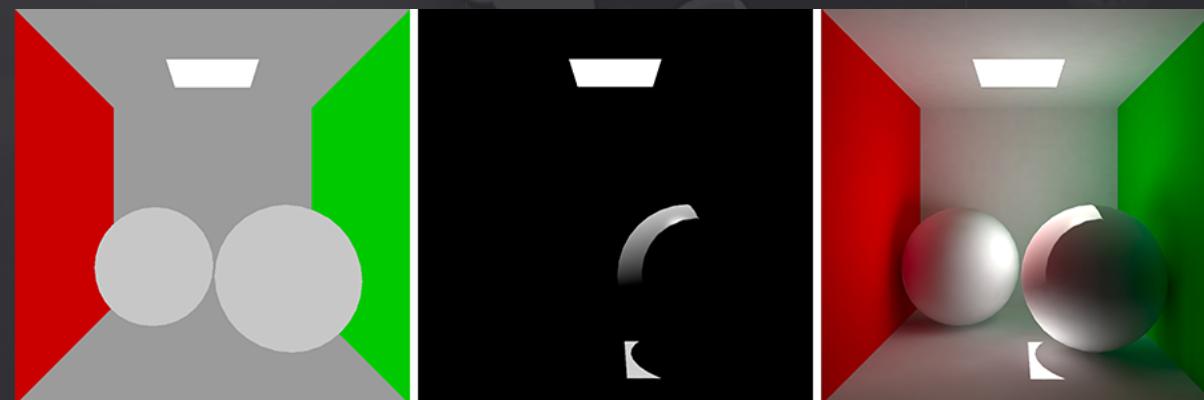


IV. Rendering fundamentals

Recognizing the importance of lighting, level designers have several perceptual goals for lighting design. They must light a level by statically defining light positions, angles, and colours to achieve the desired visual design goals. It includes setting an atmosphere and providing necessary visibility. This procedure isn't quite as simple as that, because lighting depends on technical parameters, such as processor intensive. That's why there are two types of lighting patterns : precomputed lighting and real time rendering.

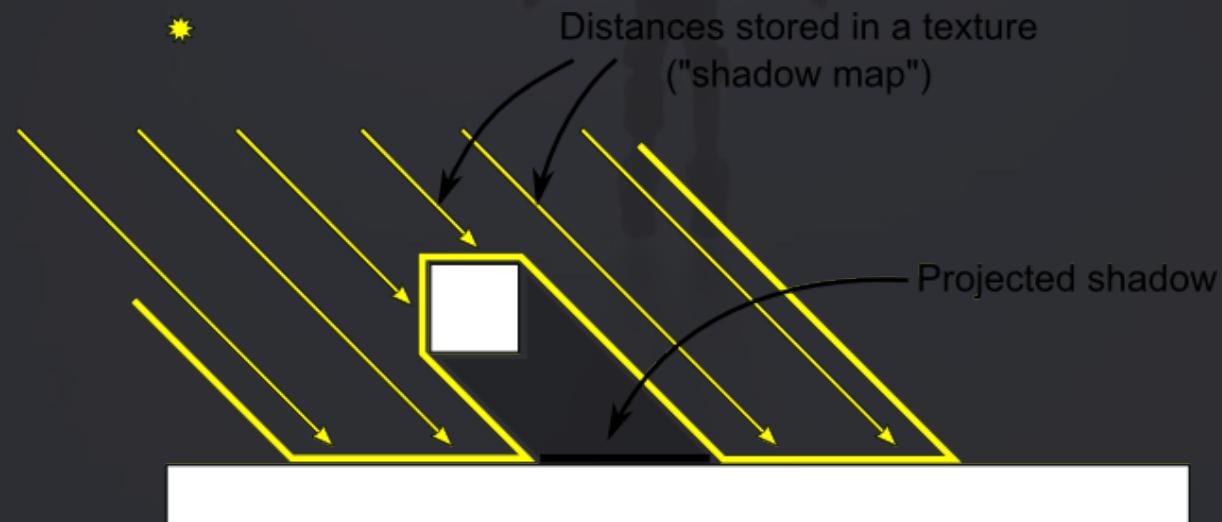
1. Precomputed lighting

Designers use static lights by setting lighting properties for each individual light, including position, angles, and colour. While real-time global illumination is for most cases impossible to achieve for performance reasons, a form of precomputed static global illumination is offered in most solutions, including Unreal Engine and Unity. The precomputed, or baked lighting, is baked in the game engine into a special texture channel called lightmap. These lightmaps are then stored along with the map files and used by the engine whenever the scene is rendered.



The same scene: With no lighting (Left), with 'direct light' only (Center) & with indirect 'global illumination' (Right) - credit : Unity Learn

As a lightmap, there is a shadow map. The method for creating shadows is called shadow map. Shadow maps are the most used technique for generating shadows. At first, the method consist in rendering the scene from the position of a light source which should cast shadow, acquiring the pixel depth from the scene. The acquired pixel depth map is called shadow map and contains distances of objects closest to the light source for each pixel. Afterward, usual render pass is done, where each surface pixel is checked against shadow map. If the distance between the pixel and light source is bigger than the one on the shadow map, the pixel is in the shadow.



Shadowmap algorythm - credit : OpenGL-tutorial

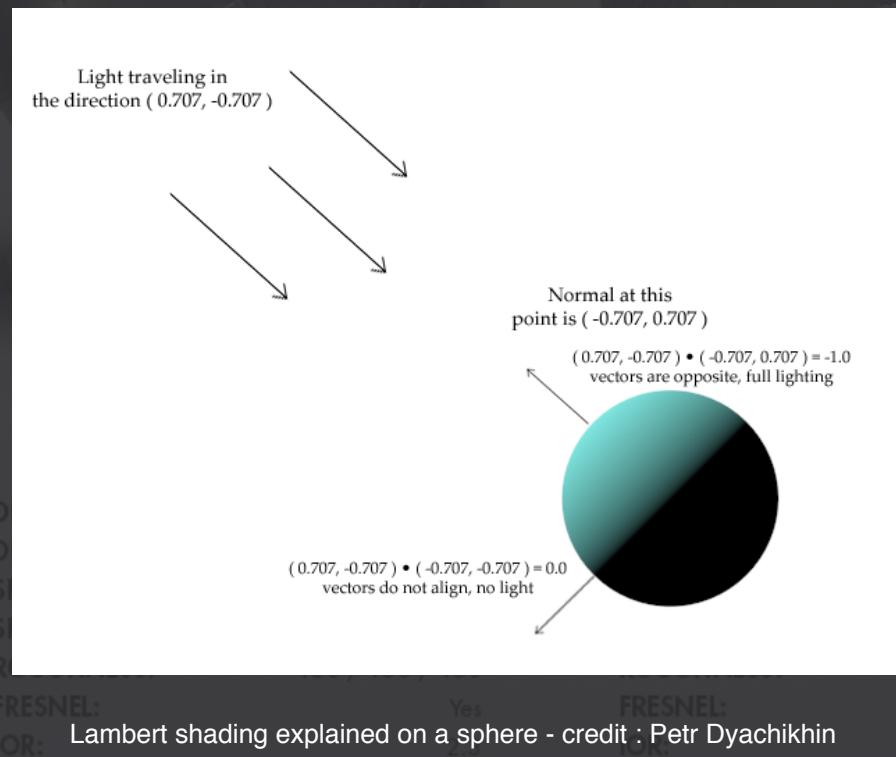
2. Real time rendering

One of the older lighting models used in real-time rendering is called Lambert, named after Swiss mathematician Johann Heinrich Lambert. In the real-time rendering, objects are usually sent one-by-one by GPU. The method consist in using the transform of an object (location, rotation and scale) to determine, which surfaces of the object to render. In case of Lambert lighting, the light is emitted from any point on the surface towards all directions. As a result, Lambertian surfaces look the same whatever the angle they are observed at is. This omits various complications, such as reflections, and others (Prall 2012). That's why, additional features are added on top of Lambert lighting computations to add realism to rendered scene, such as specular highlights.



SCRATCHED

DIFFUSE COLOR:	0 / 0 / 0
DIFFUSE AMOUNT:	0% [0]
SPEC COLOR:	255 / 255 / 255
SPEC AMOUNT:	100% [1.0]
ROUGHNESS:	3 / 3 / 3
FRESNEL:	Yes
IOR:	2.3



SMUDGED

DIFFUSE COLOR:	220 / 220 / 220
DIFFUSE AMOUNT:	0% [0]
SPEC COLOR:	255 / 255 / 255
SPEC AMOUNT:	100% [1.0]
ROUGHNESS:	3 / 3 / 3
FRESNEL:	Yes
IOR:	2.3

For now, the majority of modern game engines, such as Unity, Unreal Engine, Frostbite, and many others, use the Physically Based Rendering shading model (Orsvärn 2015). Shading PBR provides more intuitive accessible ways and parameters to describe the surface. In Unreal Engine's PBR materials, these parameters are :

- Base Color (also called albedo) - the actual texture of the surface
- Roughness - how physically rough is the surface?
- Metallic - is the surface metallic?
- Specular - the ratio of specular highlights on the surface



No PBR (left) - PBR (right) credit : Meta 3D studio

However, a new approach of rendering technique is about to begin. While the ray tracing techniques are far from, they were not taken in consideration for performance and optimization reasons. While ray tracing has been around for some time in the film and TV production worlds, the recent release of a new graphic card marked the first instance, making it possible to incorporate into video games. Ray tracing is a rendering technique that creates more realistic light effects. It's mimicking the light emission principles of the real environment. The rays cast by the light source behave as the equal of the photons. They bounce off the surfaces in random directions, and if the bounced or direct ray hits camera, it provides visual information about the surface it has bounced such as colors. Multiple games have been announced at E3 2019 supporting the new ray tracing technology.

*Real time rendering -
Frostbite engine*

3. Current light source

3.1. Point light

1.1

Point light sources emit light equally in all directions as a conventional light bulb in a real world.



1.1 - Point Light

3.2. Spot light

Spot light emits light from a single point in space in a specified cone as a conventional flashlight in a real world.



1.2 · Spot Light

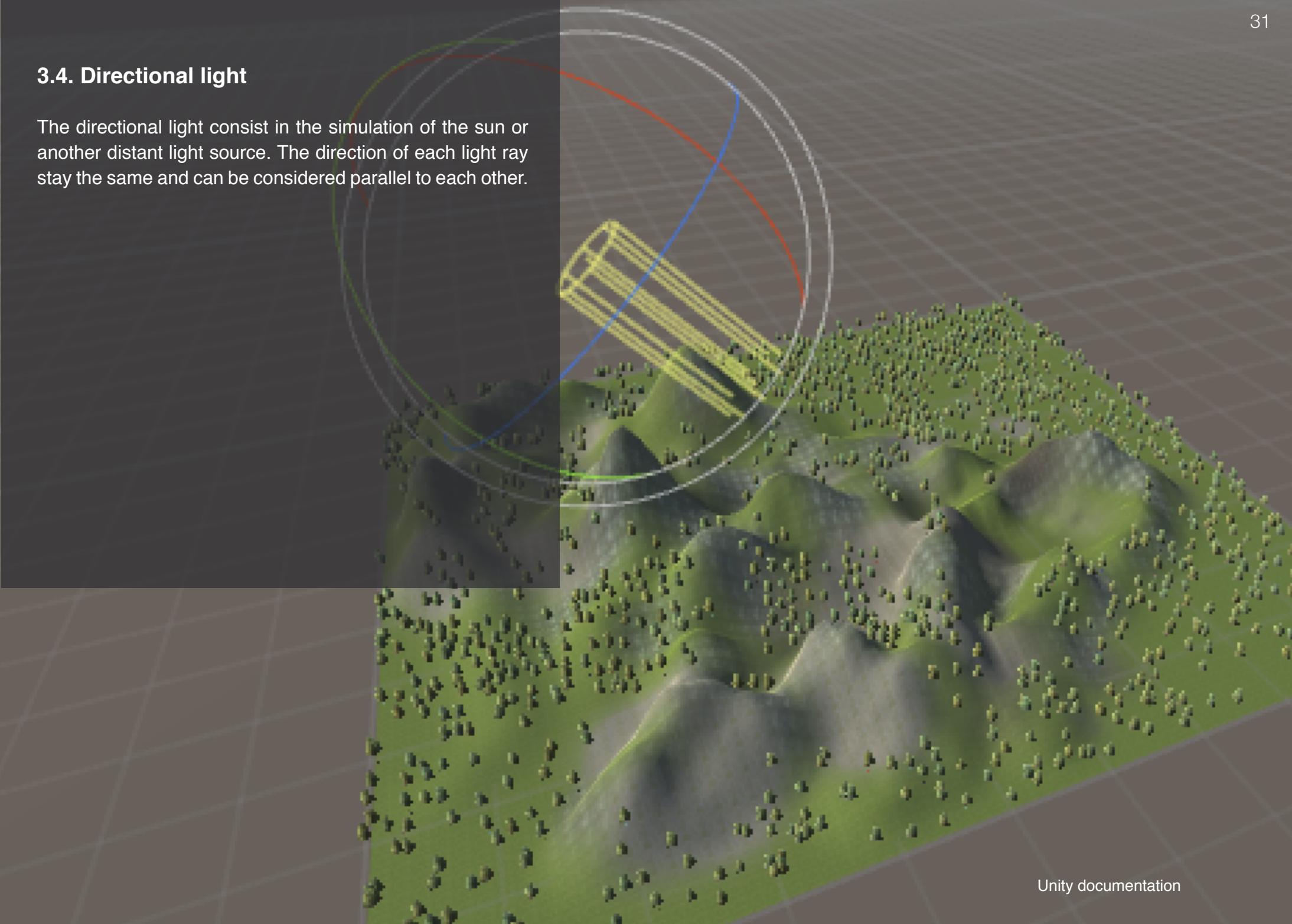
3.3. Area light

An area light is a light that casts directional light rays from a determined limit, such as a rectangle or a circle. This kind of light is processor intensive, because the computer needs to process all these extra light points.



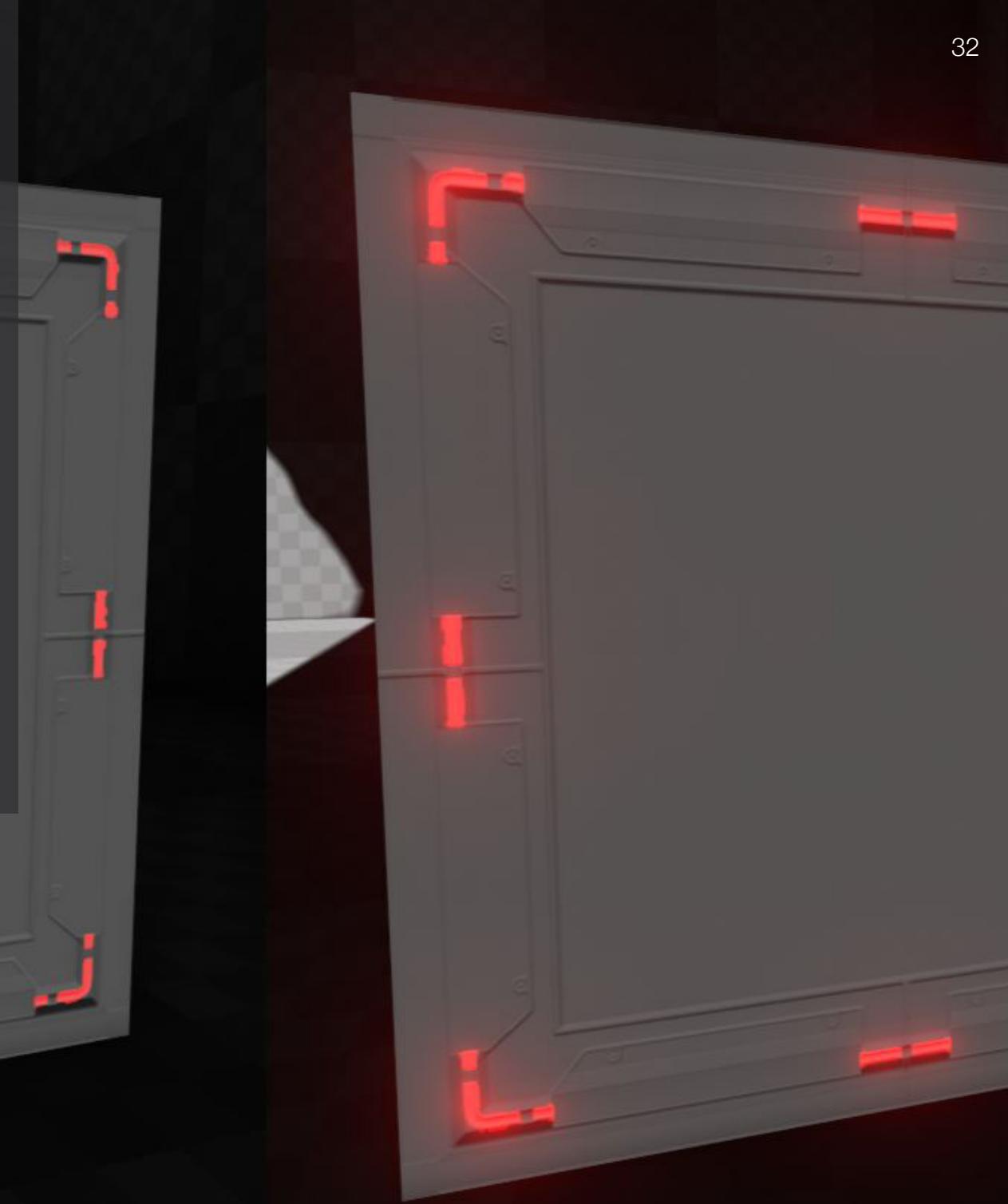
3.4. Directional light

The directional light consist in the simulation of the sun or another distant light source. The direction of each light ray stay the same and can be considered parallel to each other.



3.5. Emissive lighting

Emissive Lighting or in UE4, Emissive Materials, give a very cheap and effective way to give the illusion that a Material is casting light. Giving off a Bloom effect that you might see when looking at a very bright light source.



3.5. Ambient light

The scene from Doom 3 is illuminated by a light source on the wall. Doom's engine casts shadows. However if surfaces are covered in shadows it makes it black,. In the real-life scenario, the light particles (photons) may bounce off the surface. In more advanced rendering systems light is baked into texture or calculated in real-time (Global Illumination). Older game engines, such as Doom's ID Tech 3 Engine, indirect lighting was impossibly expensive to compute. The solution to the problem of lacking indirect light was the ambient light. Consequently all the surfaces would be lit with at least certain amount of light.



Doom 3 engine (IdTech 4 engine)

3.6. Global illumination

Global Illumination is an attempt to calculate the bouncing of light off of objects onto other objects, it is much more processor intensive than ambient light.



V. In game lighting design

Visual composition, including light placement, angles, colours, field of view, movement, have an important impact on how game environments are perceived by players. Designers, such as Will Wright during Game Developers Conference (GDC) identify several functions that visual composition assumes in game environments, including directing a player's focus to important elements in a game by balancing saturation, brightness, and hue of objects in a level. These are important goals that affect gameplay at different levels. Setting the right atmosphere is important to create the emotional involvement needed for a game. Designers must satisfy these goals while maintaining visual continuity. In addition, Magy Seif El-Nasr have conducted several experiments where users who hadn't played first-person shooter games before, were asked to play Unreal Tournament. Due to poor lighting design, set up for the needs of the experimentation, the results show that subjects were unable to spot enemies fast enough, and therefore they died very quickly. This caused frustration and, in most cases, forced players to leave the game early. Above the fact that the light produces effects, light in video game can be used in a different way than theatre, film and architecture. From a designer point of view, 7 categories which describe lighting patterns have been identified. These are also factors of emotions.

1. Guiding

Uncharted 4

Uncharted 4: A Thief's End is an action-adventure video game developed by Naughty Dog. In the book 100 Things Every Designer Needs to Know About People, Susan Weinschenk studies the importance of central and peripheral vision. Because central vision is the first thing people see, it should ideally encompass the critical elements that the designer wants the player to see. Peripheral vision acts as a context and validate central vision. If the elements in peripheral vision are dissonant with those in central vision, the designer-player communication link break down. The Uncharted games use light and central vision to their advantage. Light is strategically placed in the player's central vision to guide him. For example, when you explore Chapter 6: Once a Thief, bright rooms point you forward.



Uncharted 4 - Naughty dog

UNTIL DAWN

This survival horror game, released in August 2015 by Supermassive Games, uses lighting to guide player. Will Byles, creative director, said “The challenge for us was to create a level of fear without just darkening everything down. Unfortunately, if something gets too dark, the game engine will try to brighten it and vice versa. We had to invent some new techniques to get around that.” (Byles 2015). As shown in the picture below, the warm light stands out from the blue scene, attracting players’ attention.



2. Illuminating / Framing

RESIDENT EVIL 2 (remake)

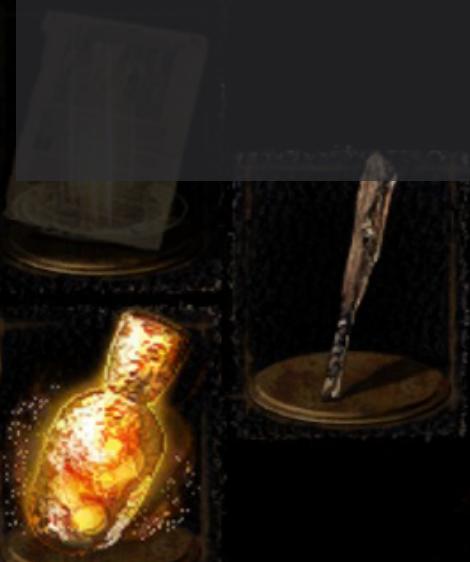
Resident Evil 2 is a survival horror game developed and published by Capcom. Light can transform the frame. When you walk through the dark halls of Raccoon City Police Department, the primary source of light comes from the player's flashlight. This forced limitation on the player's vision is a powerful mechanic. Indeed, the forced perspective condemns the player's eye and eradicate all else outside the confines of their light because of high contrast.



DARK SOULS : REMASTERED

Dark Souls is an action role-playing game developed by FromSoftware. The Tomb of the Giants is a location in Dark Souls. It is a very dark area full of treacherous falls. You can still make your way through this area by following placed bright stones carefully to avoid falling. You can already watching out for the pairs of white glowing eyes that indicates enemy. The player's light radius and ability to see in the dark is greatly reduced. But equipped with a lantern in the left hand the player's light radius and ability to see in the dark is greatly increased. However, the lantern has terrible damage reduction, so players must judge for themselves when visibility or protection is more important.

5 Heal



8 Estus Flask+2



3. Telling

PREY

Prey is a first-person shooter video game developed by Arkane. Because of the station is in orbit, the game feature a light cycle, usually indicated by the light's orientation. It also introduces a direct gameplay consequence, units and areas are harder to detect. In later sections player can solve problems by seeing them from one angle inside and another angle outside of the station.



ALIEN ISOLATION

This action-adventure game developed by Creative Assembly, released in October 2014 uses lighting to invoke fear and guide players through the environment, the game puts the player under constant stress being stalked by an alien creature.



Alien Isolation - Creative assembly

4. Hiding

SPLINTER CELL : Blacklist

Tom Clancy's Splinter Cell: Blacklist is an action-adventure stealth video game developed by Ubisoft Toronto. Lighting is used to not only guide players through the environment but is also used as a gameplay mechanic. In various sections of the game players have to use the shadows to navigate their path through the environment safely without being caught by enemies. In Splinter Cell the stealth meter is a light colour on the player character. The more hidden the player is in the environment, the brighter the colour becomes on the player's equipment.



MARK OF THE NINJA

Mark of the Ninja is a side-scrolling action stealth video game developed by Klei Entertainment. In Mark of the Ninja light and darkness are totally binary. Nels Anderson, lead designer, said «The way your character looks immediately reveals if you are visible or not - if you are concealed you are in black with red highlights, and in light you are fully coloured.» (Gamasutra - Mark of the Ninja's five stealth design rules).



5. Fighting/Defending

Alan Wake

Alan Wake is an action-adventure video game developed by Remedy Entertainment. In Alan Wake, flashlight is a weapon. Light is essential for killing the enemies. By shining light on them long enough, they will be susceptible to bullets and can be killed. A halo will appear where the light interacts with the enemy and over a short amount of time, will shrink until the object flashes. At this moment player is able to kill the enemy with his gun. Other methods of removing the enemy include mobile construction lights, flares and flashbang grenades.



Alan Wake - Remedy Entertainment

A PLAGUE TALE INNOCENCE

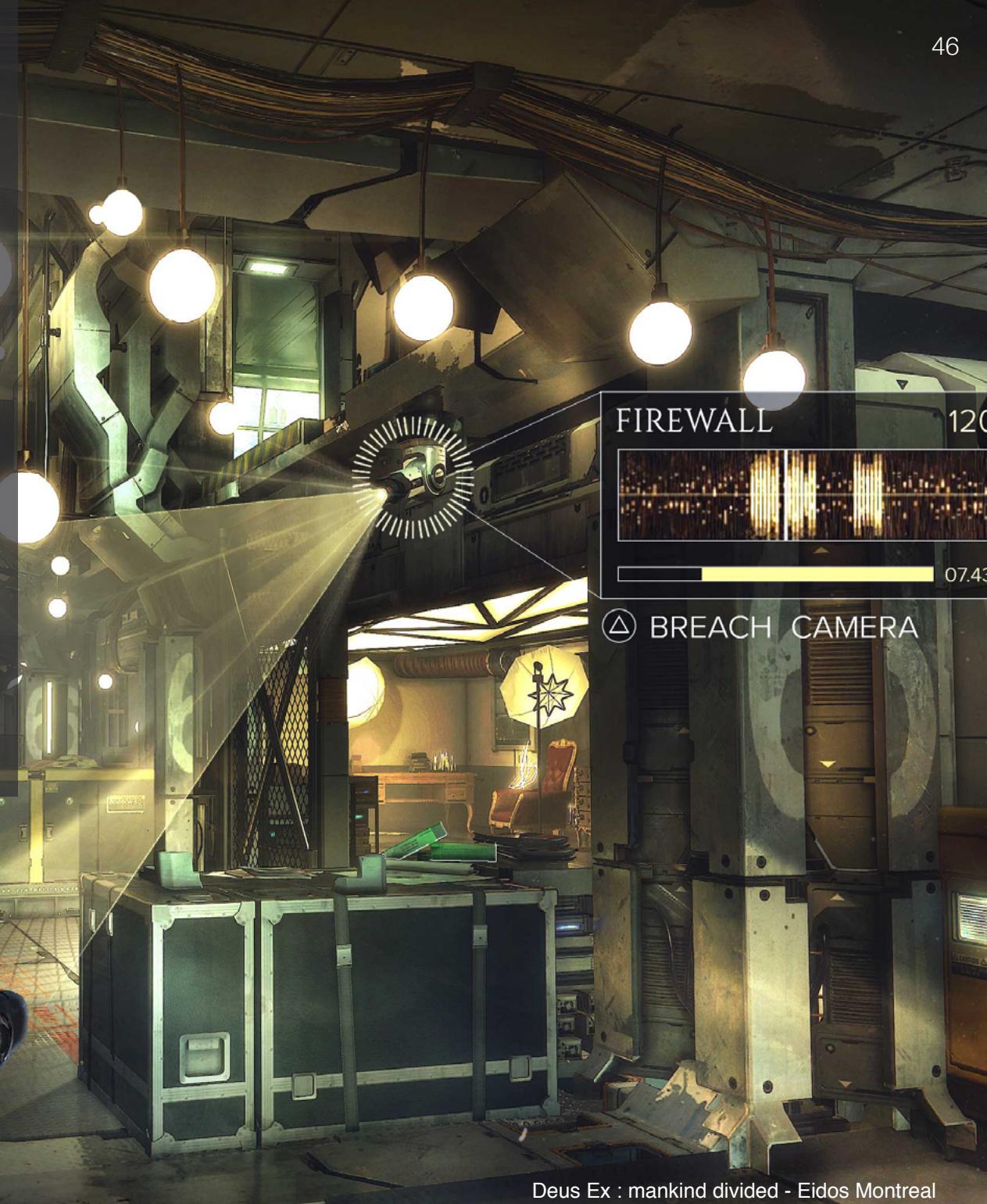
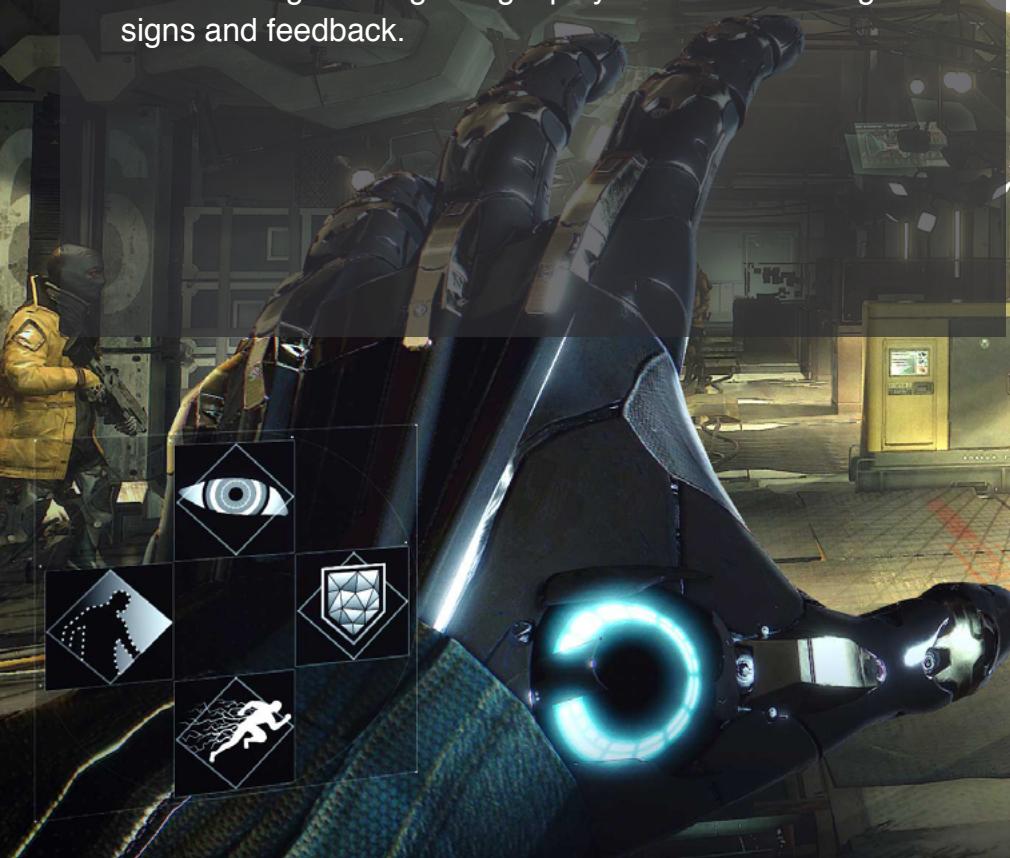
A Plague Tale: Innocence is an action-adventure game developed by Asobo Studio. Sometimes you can use the rats against the humans. For example you can break a source of light helded by an enemy and he became suddenly plunged into the darkness among the swarm of rats.



6. Signaling/Feedbacking

Deus Ex : mankind divided

Deus Ex: Mankind Divided is an action role-playing video game developed by Eidos Montréal. Security camera is a camera arranged to watch what goes on in their field of vision evidenced by a cone of light. Their light is green when neutral. When they see an enemy, they turn yellow and beep, following the target either for a few seconds or until the target can escape the camera's sight. After a few seconds of watching an enemy, it will turn red and sound an alarm. Light. The game get player's attention using clear signs and feedback.



Deus Ex : mankind divided - Eidos Montreal

Hollow knight

Hollow Knight is a Metroidvania video game developed and published by Team Cherry. The lighting changes more often than player notice. For example, each time you take damage, the game freezes for a moment and a sharp crack effect appears near your character. The ambient lighting dims, but nearby sources like lamps and fireflies stay bright. It makes each hit the player take feel important and impactful.



7. Sequencing

Assassin's creed : odyssey

Assassin's Creed Odyssey is an action role-playing video game developed by Ubisoft Quebec. The game is governed by a day/night cycle, once the night come, patrols are reduced and player could experience a stealthier approach. He has the option to change time of a day whenever he wants. By holding the right button to speed up time until night time. Enemies' sight is reduced during this part of a day. Moreover, some of them will go to sleep. You will be able to avoid or attack enemies with greater ease. Light is employed in a systemic way where rules of play change radically from daytime.



Don't starve

Don't Starve is an open world survival video game developed by the Canadian indie company Klei Entertainment. Night is a very confusing time for novice players, because venturing out into the night is fatal. After 5 seconds the player is attacked and damaged. In order to survive the night, the player needs to be near a light. Mobs will fall asleep as soon as night starts and will wake when night is over. Other creatures that sleep during the day may wake. Plants will not grow. Meat will not dry. As seen before, the day/night cycle falls within a systemic approach, dividing into two categories the rules of play.



VI. Conclusion

In summary, many lighting design techniques exhibited in painting, theatre, film and architecture are used by game developers to enrich the aesthetic sense of the virtual space and the gaming experience. However, the interactive nature of games distinguishes them significantly from cinema and theatre. Because of interactivity, the game environments are dynamic and unpredictable. Therefore dynamic light exists and provides some support to the static light. These two complementary practices make possible interaction, emotion and dramatic content. Light is a rich medium of possibility for all trades in the video game production industry. His power of evocation is immense for both artists and designers. Advancements in technology have also completely changed lighting in game engines. Now light have much more settings and options to create specific lighting instead of using lighting to just illuminate the environment. With more research and studies into this area, we could expand possibilities both on design and art especially with the arrival of ray tracing technique.

VII. Showcase project

The Dark Mod

The Dark Mod takes place in a classic gothic steampunk world. This includes a crossover of elements of fantasy, the Late Middle Ages, the Victorian era and the Industrial Revolution. Although set in a very similar world to that of the original Thief series, the mod does not use any of the original Thief intellectual property. The player is an agile thief in a hostile world. He has to use his equipment and the environment to avoid guards, traps, creatures or other threats. His equipment include a blackjack, water arrows, holy water, flash bombs, mines, and more. Since the player has only a limited fighting capability, he is supposed to sneak and hide in dark, mostly avoiding combat.

The Dark Mod was originally released as a total conversion modification for Doom 3, but with the release of version 2.0 it became completely standalone on the id Tech 4 game engine. The mod was originally developed as a toolkit. It includes models, sounds, AI, art, tools, and a specialized editor for users to create custom missions. The Dark Mod 2.06 includes code from the dhewm3 fork of the id Tech 4 game engine that was ported to 64-bit.

Featured in 2.07, two varieties of soft shadows :

- Blurred shadow volumes with a blurring algorithm similar to PCSS
- Shadow mapping with true PCSS blurring

The Dark Mod project has been developped in an other PDF document attached to this document.

VIII. References

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Yoda -
Star Wars